WHAT IS CLAIMED IS:

1. A process for the production of a complex carbohydrate which comprises the steps of:

(a) inoculating transformed production cells into a culture medium capable of supporting the growth of said production cells wherein said production cells are prepared by transforming bacteria comprising (i) a core lipid structure containing a terminal heptose molecule and (ii) an enzyme capable of adding an acceptor molecule to said heptose molecule by inserting an isolated DNA sequence encoding glycotransferase synthesizes a complex carbohydrate into said bacteria to yield transformed production cells;

(b) allowing growth of said transformed production cells; and

(c) recovering said complex carbohydrate from the culture medium.

2. The transformed production cell of claim 1.

3. The transformed production cell of claim 2 comprising a gram-negative bacterium having a terminal heptose on a kdo core and having inserted an isolated DNA sequence encoding the glycotransferase catalyzing the synthesis of an oligosaccharide of *Haemophilus influenzae*.

4. The transformed production cell of claim 3 comprising *Escherichia coli* K-12 strain JM 109.

5. The process of claim 1 wherein the bacteria are gram-negative bacteria.

6. The process of claim 1 wherein the bacteria is *Escherichia coli* K-12 strain JM 109.

7. The process of claim 1 wherein the acceptor molecule is [N-acetyl] galactose.

8. The process of claim 1 wherein the isolated DNA sequence encodes a functional *Haemophilus influenzae* glycotransferase.

9. The process of claim 1 wherein the isolated DNA sequence encodes a functional *Neisseria gonorrhoeae* glycotransferase.

10. The complex carbohydrate made according to the process of claim 1.

11. A process for the production of an oligosaccharide which comprises the steps of:

(a) transforming gram-negative bacteria comprising (i) a core lipid structure containing a terminal heptose and (ii) an enzyme that adds a galactose molecule to said heptose wherein said transformed gram-negative bacteria are prepared by constructing a vector comprising an isolated DNA sequence coding for a glycotransferase that synthesizes an oligosaccharide;

(b) inoculating said transformed gram-negative bacteria into a culture medium capable of supporting the growth of said transformed bacteria;

(c) allowing growth of said inoculated gram-negative bacteria; and

(d) recovering said oligosaccharide from the culture medium.

12. The process of claim 11 wherein the transformed bacteria is *Escherichia coli* K-12 transformed with an isolated DNA sequence from *Haemophilus influenzae*.

13. The oligosaccharide made by the process of claim 11.

14. The process of claim 11 wherein the transformed bacteria is *Escherichia coli* K-12 transformed with an isolated DNA sequence from *Neisseria gonorrhoeae*.

15. The oligosaccharide made by the process of claim 14.

16. A process for the production of a complex carbohydrate, comprising culturing production cells comprising a chimeric DNA sequence encoding a glycotransferase so as to yield production cells comprising an altered level of complex carbohydrate, wherein the production cells are bacteria comprising a core lipid structure containing a terminal heptose molecule and encoding an enzyme capable of adding an acceptor molecule to the heptose molecule.

17. The process of claim 16 further comprising recovering the complex carbohydrate.